

JAN 19 1995



17 January 1995

Mr. Reginald Lunt  
Metromail Corporation  
1 Seward Road  
Rutland, Vermont 05701

Re: Initial Site Investigation Report for Metromail Corporation, Rutland, Vermont  
VT DEC Site #94-1674

Dear Mr. Lunt:

Please find enclosed a copy of the above-referenced document. The report summarizes the findings of our initial site investigation. As discussed earlier today by telephone, a copy of this report is being forwarded to the State of Vermont Department of Environmental Conservation.

Ground Water of Vermont appreciates having the opportunity to perform this work for you. Please call me at (802) 860-6065 if you have any questions or comments.

Sincerely,

A handwritten signature in cursive script, appearing to read "Parminder K. Grewal".

Parminder K. Grewal  
Environmental Engineer

cc: Richard Spiese, VT DEC

Enclosure: Report

REPCOV.SAM

**INITIAL SITE INVESTIGATION REPORT**

**Metromail Corporation  
1 Seward Road  
Rutland, Vermont**

**VT DEC Site #94-1674**

**17 January 1995**

Prepared for:

**Reginald Lunt  
Metromail Corporation  
1 Seward Road  
Rutland, Vermont 05701**

Prepared by:

**Ground Water of Vermont  
1 Mill Street, Box C-5  
Burlington, Vermont  
(802) 860-6065**

**GWV Project #V94-048**

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## EXECUTIVE SUMMARY

An initial site investigation conducted by Ground Water of Vermont (GWV) at the Metromail Facility in Rutland, Vermont has evaluated the degree and extent of soil and ground water petroleum contamination in the vicinity of a former 10,000-gallon heating-oil underground storage tank (UST). The soil and ground water contamination appears to be limited in degree and extent, and does not appear to pose a significant threat to nearby potential receptors. GWV recommends that quarterly monitoring of the site be conducted for one year to confirm that contaminant levels decrease over time.

The subsurface investigation consisted of the installation, sampling, and analysis of three soil boring/monitoring wells in the vicinity of the removed UST. Soil samples were collected from the borings and screened using a photoionization detector (PID). Three soil samples from the soil boring in the former UST pit were analyzed for the EPA Method 8020 list of volatile organic compounds (VOCs) and for Total Petroleum Hydrocarbons (TPH) by modified EPA Method 8100. Relative ground water elevations were measured to determine ground water flow direction and gradient. Water samples collected from the monitoring wells were analyzed for the EPA Method 8020 VOCs and for TPH by EPA Method 418.1.

Soils encountered during subsurface explorations consisted of fine sand and gravel, underlain by fine sands and silts. Bedrock was not encountered during the installation of the soil boring/monitoring wells. Ground water in the monitoring wells was measured at depths of 16.2 to 16.7 feet below ground surface, and was flowing toward the northwest at a 3% gradient.

PID screening of soil samples collected from three borings at the site indicates that soils in the immediate vicinity of the former UST contain petroleum compounds above the PID-based Vermont guideline standard. Analytical testing of the soils beneath the former UST indicated that the soils contained from 3 to 81 ppm of TPH, but no detectable levels of VOCs. PID screening results from the soil borings installed downgradient of the UST were below the Vermont guideline standard, suggesting that the soil contamination is limited in extent.

Ground water analytical results from the three monitoring wells indicated the presence of benzene, 1,2-dichlorobenzene, and 1,4-dichlorobenzene. Benzene was detected at a level above the Vermont Ground Water Enforcement Standard in one downgradient well, and at a level below the Standard in the well located in the former UST pit. Dichlorobenzenes, which are not contained in fuel oil, were detected in all of the monitoring wells, at concentrations below the Vermont Ground Water Enforcement Standards.

No threatened sensitive receptors were identified as a result of this investigation. The Metromail building does not have a basement, and is located upgradient of the former UST. The Metromail building and surrounding buildings are supplied with municipal water and sewer service. Although a small stream is located approximately 400 feet downgradient of the area of contamination, the low VOC levels in the monitoring wells suggest that it is unlikely that the stream will be impacted. The remaining low levels of in-situ soil and ground water contamination will likely decrease over time through the processes of degradation, dilution, and dispersion.

## 1.0 INTRODUCTION

This report details the finding of a site investigation conducted at the Metromail Facility in Rutland, Vermont. The report has been prepared by Ground Water of Vermont (GWV) for Reginald Lunt of the Metromail Corporation.

The site investigation has been conducted in accordance with the "expressway" process described in the Vermont Department of Environmental Conservation (VT DEC) Guidance Document to Evaluate and Remediate Hazardous Waste Sites.

On 26 September 1994, Metromail retained the services of Ground Water of Vermont to perform this work.

### 1.1 Scope of Work

In accordance with the VT DEC guidance document, GWV has performed the following:

- Reviewed existing data on the site;
- Supervised the installation of three soil boring/monitoring wells on the property;
- Determined ground water flow direction and gradient;
- Collected and submitted for laboratory analysis soil and ground water samples from the soil boring/monitoring wells;
- Identified potential receptors of the contamination;
- Assessed the risk that the contamination poses to these potential receptors;
- Evaluated the need for treatment and/or long-term monitoring at the site; and
- Prepared this summary report, which details the work performed and provides conclusions and recommendations.

### 1.2 Site Location and Physical Setting

The site is located in the Town of Rutland, Vermont, along the north side of Seward Road. Seward Road intersects U.S. Route 7 just south of the Rutland city line (see Figure 1, Site Location Map). The site and the area surrounding the site are used for industrial purposes.

The site is located on land that appears to have been filled to create a grade acceptable for truck traffic. The general topography of the area slopes slightly to the northwest. A westward flowing stream is located approximately 400 feet north of the property.

## 2.0 SITE HISTORY

The site is currently owned by the Metromail Corporation. The building located on the property is used to assemble and ship mass mailings. Two 10,000-gallon underground storage tanks (USTs) containing No. 2 fuel oil were located on the north side of the building. Fuel oil in the tanks was used for on-site space heating purposes.

On 22 August 1994, one of the fuel-oil USTs was removed by Precision Industrial Maintenance, Inc. of Rutland, Vermont. Petroleum contamination was noted during the removal of the UST in the soils of the tank pit. Some free-phase product was observed seeping into the west side of the 15-foot excavation. No ground water was encountered in the tank pit. The UST was reported to be in fair condition upon removal. A photoionization detector (PID) was used to field-screen soils in the excavation and soils were found to contain some volatile organic compound (VOC) contamination. Reported PID readings were as high as 347 parts per million (ppm), with an average reading of 160 ppm.

In November 1994, the remaining UST passed a precision tightness test.

### **3.0 INVESTIGATIVE PROCEDURES AND RESULTS**

#### **3.1 Soil Boring/Monitoring Wells**

On 13 October 1994, GWV supervised the installation of three soil boring/monitoring wells in the vicinity of the former underground storage tank on the site. Approximate boring locations are shown on Figure 2. Boring logs are presented in Appendix B. The soil boring/monitoring wells were installed by Technical Drilling Services of Leominster, Massachusetts using a hollow-stem-auger drill rig with 4.25-inch inner-diameter augers. Prior to installing the borings, GWV contacted Dig Safe and the Town of Rutland Public Works Department in an effort to locate potential underground utilities.

Two soil borings (MW-1 and MW-2) were located approximately 40 feet in the probable downgradient direction from the former UST location in order to evaluate the extent of contaminant migration from the source area. One boring (MW-3) was located in the former UST pit to evaluate the degree of contamination in the source area.

Soil conditions in all of the soil borings consisted of approximately 5 feet of coarse-to-fine sand and gravel fill, underlain by native silt and fine sand with some gravel.

Monitoring wells were installed in all of the soil borings. Monitoring well construction details are shown in the well logs in Appendix B.

#### **3.2 Soil Screening Results**

Soil screening results from the MW-3 boring indicated that soil contamination above the Vermont PID-based guideline standard of 10 ppm for fuel-oil contaminated soils exists in the upper 30 feet at the former UST pit. Screening results from the other two borings indicated that soils downgradient of the UST are below the Vermont guideline standard.

Soil samples were collected every 5 feet from each soil boring, using a split-spoon sampler. The samples were screened in the field for VOCs with a Photovac TIP II portable PID, which had been calibrated with isobutylene gas to a benzene reference. PID screening results are presented in Table 2. PID readings in MW-1 and MW-2 ranged from 2.7 to 6.8 ppm. PID readings in MW-3 ranged from 6.7 to 75.0 ppm.

#### **3.3 Soil Sampling Results**

The three soil samples with the highest PID readings from the MW-3 soil boring were analyzed at a laboratory for the EPA Method 8020 list of VOCs by EPA Method 8260, and for TPH by modified EPA Method 8100. Analytical results are summarized in Table 3. TPH was detected in the soils at concentrations between 3 ppm and 81 ppm. The highest TPH level was in the sample collected from 10 to 12 feet below ground surface, which corresponds to the approximate depth of the former UST bottom. No samples from the other two borings were submitted for laboratory analysis, based on the low PID readings.

### 3.4 Determination of Ground Water Flow Direction and Gradient

On 20 October 1994, ground water in the surficial aquifer in the immediate vicinity of the monitoring wells was determined to be flowing toward the northwest at an approximate gradient of 3%. The depth to ground water was between 16.2 and 16.7 feet below ground surface in the wells. Relative water table elevations in the monitoring wells were determined by subtracting the measured depth to water in each well from a surveyed top-of-casing relative elevation. Water level measurements and elevation calculations are presented in Table 1 in Appendix A. A ground water contour map (see Figure 3) was prepared using this data.

### 3.5 Ground Water Sampling and Analysis

Results of the analytical testing indicate that volatile organic compounds are present in ground water at the site. Benzene was detected in two wells. The chlorinated compounds 1,2-dichlorobenzene and 1,4-dichlorobenzene were detected in all of the wells. Only the benzene concentration in the MW-2 sample exceeded the Vermont Ground Water Enforcement Standards. Analytical results are summarized in Table 4 in Appendix A. Laboratory report forms are included in Appendix C.

Benzene was detected in the MW-2 sample at 16 ppb, which exceeds the Vermont Ground Water Enforcement Standard of 5 ppb. Benzene was also detected in the MW-3 sample at 2 ppb, which is below the Vermont Ground Water Enforcement Standard. Benzene was not detected in the MW-1 sample. TPH was not detected in any of the monitoring wells.

Two chlorinated VOCs— 1,2- dichlorobenzene and 1,4- dichlorobenzene— were detected in all of the monitoring wells. Concentrations of 1,2- dichlorobenzene ranged from 5 to 11 ppb; these levels are below the Vermont Ground Water Enforcement Standard of 620 ppb. Concentrations of 1,4- dichlorobenzene ranged from 1 to 4 ppb; these levels are also below the Vermont Ground Water Enforcement Standard of 75 ppb. Virgin fuel oil does not contain dichlorobenzenes.

Ground water sampling was conducted on 20 October 1994, and followed GWV's Ground Water Sampling Protocol. The water samples were submitted to an analytical laboratory, where they were tested for EPA Method 8020-listed VOCs by EPA method 8260, and for TPH by EPA Method 418.1. A trip blank and an equipment blank were collected and analyzed for VOCs, to verify proper quality assurance and quality control (QA/QC).

Analytical results from the QA/QC samples indicate that adequate QA/QC was maintained during sample collection and analysis. No petroleum compounds were detected in the trip blank or equipment blank samples.



## **4.0 RECEPTOR SURVEY AND RISK ASSESSMENT**

### **4.1 Receptor Survey**

GWV performed a limited survey of the area to identify potential receptors in the area of the contamination. Potential receptors identified include the on-site building and the creek located approximately 400 feet north of the property. The identified contamination does not appear to pose a significant risk to any of these receptors.

The on-site building is located immediately south of the former UST location. The westward-flowing creek is approximately 400 feet to the north. No drinking water supply wells are located between the former UST location and the creek. According to well completion records on file at the VT DEC, nine water supply wells are located with one-half mile of the site. The closest identified well is an 800-foot deep bedrock well located approximately 1,000 feet southeast of the site. The site and surrounding areas are served by municipal water.

### **4.2 Risk Assessment**

On the basis of the findings reached during this survey, GWV has qualitatively evaluated the risks that the contamination at the site poses to these potential receptors. Heating oil contains several compounds that are hazardous to human and animal health, including benzene which is listed by the U.S. Environmental Protection Agency (EPA) as a known human carcinogen. The most common routes of exposure include ingestion of compounds that have migrated to drinking water supplies and inhalation of vapors that have migrated into buildings. Fuel-oil compounds can also adversely impact surface water bodies and water dwelling organisms.

The risk of ingestion of petroleum compounds due to contamination of drinking water supplies at the site does not appear to be significant. Although laboratory analyses of ground water samples collected from this site indicate that benzene is present above the Vermont drinking water standard of 5 ppb in one of the wells, petroleum compound levels are below Vermont drinking water standards in both of the other wells. The closest drinking water supply is a bedrock well located 1,000 feet in the upgradient direction from the site.

The risk of petroleum vapor inhalation also does not appear to be significant. The on-site building is located upgradient of the contamination and does not contain a basement. It is thus considered unlikely that the building will be impacted by petroleum vapor migration. No other buildings are located in the vicinity of the contaminated area.

The westward-flowing creek north of the property is the likely discharge point of ground water that flows through the surficial aquifer beneath the former UST location. The low level of VOCs and absence of TPH in all of the on-site monitoring wells and the low expected hydraulic conductivity of the fine sand and silt soils in the surficial aquifer suggest that the natural processes of dilution, dispersion, and degradation will reduce petroleum compound concentrations in ground water to below detectable levels prior to discharge to the creek.

## 5.0 CONCLUSIONS

On the basis of the above-described investigation, Ground Water of Vermont has concluded the following:

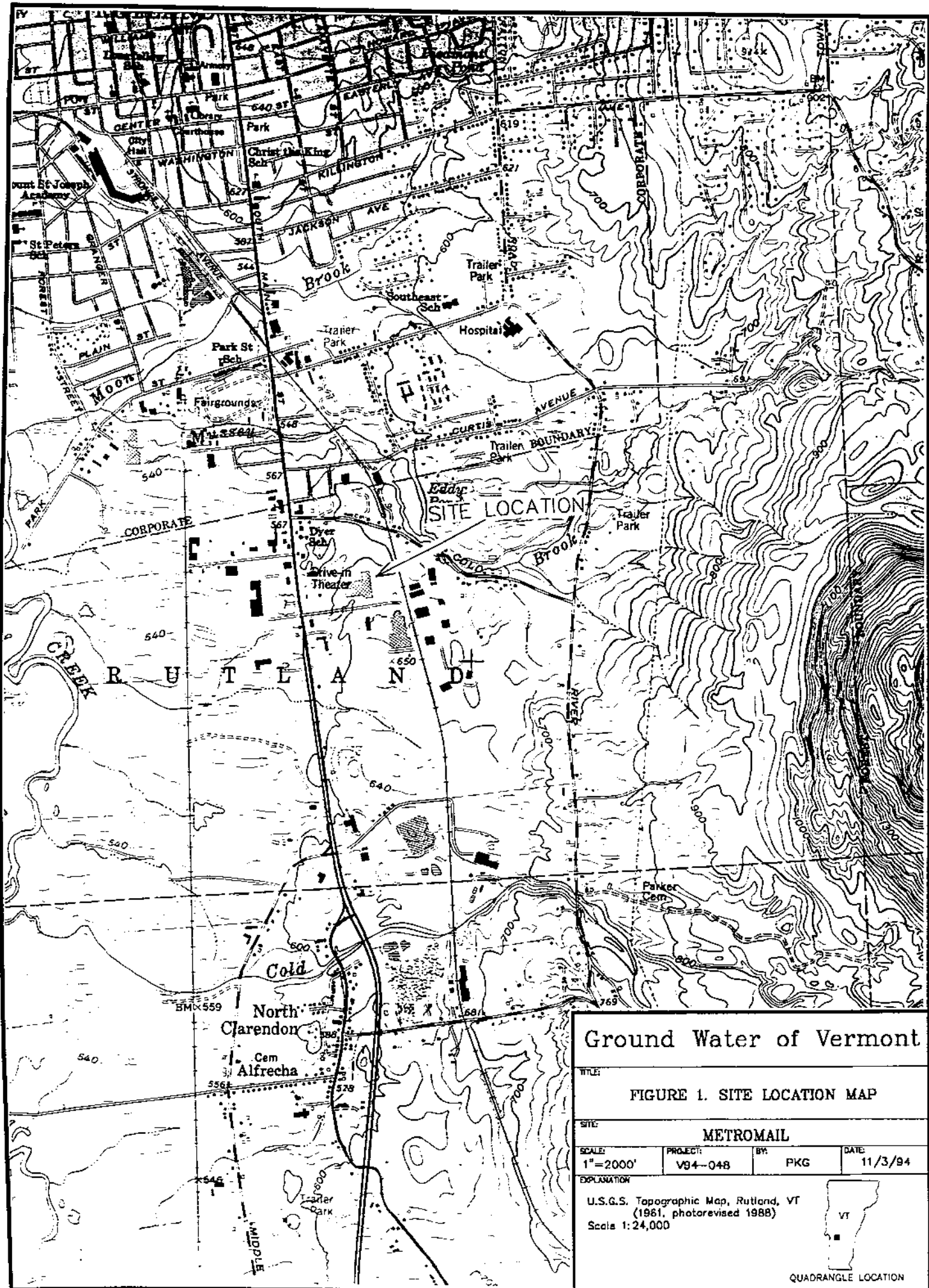
1. There has been a release or releases of petroleum to the subsurface at the site, which appears to have been caused by a failure or failures in the former heating oil underground storage tank (UST) system.
2. The apparent source of contamination was removed from the ground on 22 August 1994 and was not replaced.
3. The remaining 10,000 gallon UST passed a precision tightness test conducted on 11 November 1994.
4. Soils in the immediate vicinity of the UST location were impacted by the release(s). During the UST removal, photoionization detector (PID) readings on soil samples collected in the former UST pit were reportedly as high as 347 ppm.
5. PID screening of soil samples collected from three soil borings at the site on 13 October 1994 indicates that soils in the immediate vicinity of the former UST contain petroleum compounds above the PID-based Vermont guideline standard. Analytical testing of the soils beneath the former UST indicated that the soils contained from 3 to 81 ppm of Total Petroleum Hydrocarbons (TPH) but no detectable levels of volatile organic compounds (VOCs). PID screening results from the soil borings installed downgradient of the UST were below the Vermont guideline standard, suggesting that the soil contamination is limited in extent.
6. Ground water in the surficial aquifer at the site has also been impacted by the petroleum release(s). In one of the downgradient wells (MW-2), benzene was detected at 16 ppb, which is above the Vermont Ground Water Enforcement Standard of 5 ppb. Benzene was also detected in the well located in the former UST pit (MW-3) at a level below the Vermont standard.
7. Dichlorobenzenes, which are not contained in fuel oil, were detected in all of the monitoring well samples, at levels below Vermont Ground Water Enforcement Standards.
8. Ground water in the monitoring wells was 16.2 to 16.7 feet below ground surface and was flowing toward the northwest at a gradient of approximately 3%.
9. Soils at the site consisted of sand and gravel fill from the surface to a depth of 5 feet, underlain by fine sands and silt. Bedrock was not encountered in any of the borings.

## 6.0 RECOMMENDATIONS

On the basis of the findings reached during this investigation, Ground Water of Vermont makes the following recommendations:

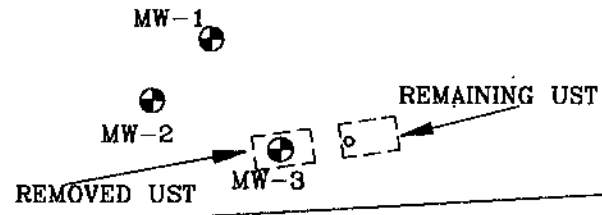
1. The monitoring wells should be sampled and analyzed for BTEX quarterly for one year to confirm that contaminant levels decrease over time.

**APPENDIX A**  
**FIGURES AND TABLES**





PARKING  
AREA



METROMAIL BUILDING

PARKING  
AREA

Ground Water of Vermont

TITLE:

FIGURE 2. SITE MAP

SITE:

METROMAIL, RUTLAND

SCALE:

1" = 50'

PROJECT:

V84-048

BY:

PKG

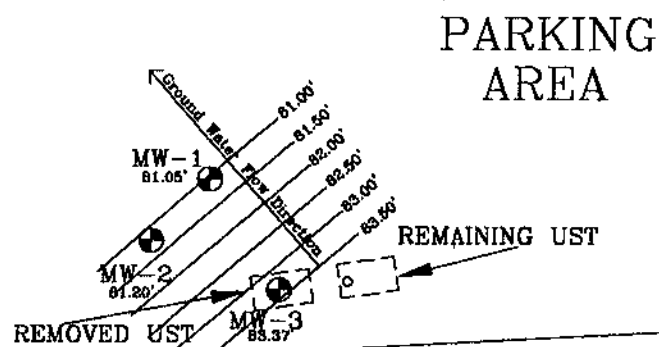
DATE:

10/25/94

EXPLANATION



Monitoring Well



METROMAIL BUILDING

## Ground Water of Vermont

TITLE:

FIGURE 3. GROUND WATER CONTOUR MAP

SITE:

METROMAIL, RUTLAND

SCALE:

1" = 60'

PROJECT:

V94-048

BY:

PKG

DATE:

10/25/94

EXPLANATION



Monitoring Well

—81.00' Ground Water Contour Line

PARKING  
AREA

**Table 1. Liquid Level Calculations**

**Metromail  
Rutland, Vermont**

Monitoring Date: 20 October 1994

Well I.D.	Top of Casing Elevation	Depth to Ground Water	Relative Ground Water Elevation
MW-1	97.33	16.28	81.05
MW-2	97.42	16.22	81.20
MW-3	100.00	16.63	83.37

**Note:** All values reported in feet, arbitrary datum



**TABLE 2. SOIL SCREENING RESULTS****Metromail  
Rutland, Vermont**

Sampling Date: 13 October 1994

LOCATION	DEPTH (FEET)	BACKGROUND	RESPONSE
MW 1	5-7	0.0	2.9
	10-12	-0.1	2.7
	15-17	0.1	3.8
	20-22	0.0	2.9
	25-27	0.0	2.7
MW 2	5-7	0.0	5.6
	10-12	-0.1	2.8
	15-17	0.0	6.3
	20-22	0.0	6.8
	25-27	0.0	6.7
MW 3	2-4	0.0	57.6
	7-9	0.0	46.7
	10-12	0.0	75.0
	15-17	0.1	29.0
	20-22	0.0	12.2
	25-27	0.0	10.2
	30-32	0.0	6.7
	35-37	0.0	7.5

**TABLE 3. SOIL ANALYTICAL RESULTS**

**Metromail  
Rutland, Vermont**

Sampling Date: 13 October 1994

Station	Date	Benzene	Toluene	Ethyl benzene	Xylenes	Total BTEX	MTBE	TPH
MW-3: 10'-12'	10/13/94	BPQL<1	BPQL<1	BPQL<1	BPQL<3	BPQL	BPQL<1	81
MW-3: 20'-22'	10/13/94	BPQL<1	BPQL<1	BPQL<1	BPQL<3	BPQL	BPQL<1	4
MW-3: 35'-37'	10/13/94	BPQL<1	BPQL<1	BPQL<1	BPQL<3	BPQL	BPQL<1	3

**Notes:** BTEX results reported in parts per billion (ppb);  
TPH results reported in parts per million (ppm).  
BPQL = Below Practical Quantitation Limits.

**TABLE 4. GROUND WATER ANALYTICAL RESULTS**

Metromail  
Rutland, Vermont

Sampling Date: 20 October 1994

Station	Date	Benzene	Toluene	Ethyl benzene	Xylenes	Total BTEX	1,2- Dichloro- benzene	1,4- Dichloro- benzene	MTBE	TPH
MW-1	10/20/94	BPQL<1	BPQL<1	BPQL<1	BPQL<3	BPQL	5	1	BPQL<1	BPQL
MW-2	10/20/94	16	BPQL<1	BPQL<1	BPQL<3	16	11	4	BPQL<1	BPQL
MW-3	10/20/94	2	BPQL<1	BPQL<1	BPQL<3	2	7	2	BPQL<1	BPQL
FIELD BLANK	10/20/94	BPQL<1	BPQL<1	BPQL<1	BPQL<3	BPQL	BPQL<1	BPQL<1	BPQL<1	NS
TRIP BLANK	10/20/94	BPQL<1	BPQL<1	BPQL<1	BPQL<3	BPQL	BPQL<1	BPQL<1	BPQL<1	NS
VT GROUND WATER ENFORCEMENT STANDARD	—	5	2,400	680	400	—	620	75	40	—

**Notes:** BTEX results reported in parts per billion (ppb);  
TPH results reported in parts per million (ppm).  
BPQL = Below Practical Quantitation Limits.  
NA- Not Analyzed.

**APPENDIX B**  
**BORING LOGS**



# Ground Water of Vermont

FIELD SUPERVISOR PARMINDER GREINAL  
CONTRACTOR TDS  
DRILLERS

JOB LOCATION METROMAIL  
RUTLAND, VT  
DATE 10/13/94

DRILLING METHOD  
HOLLOW STEM AUGER

BORING DIAMETER 4.25'

AND 40 - 50%  
SOME 10 - 40%  
TRACE 0 - 10%

BORING LOCATION

BORING # MW-1

sketch on back or on-site plan

with measurements

TOTAL DEPTH

25'

DEPTH	SAMPLES	SAMPLE NUMBER	BLOWS PER 6"				TRACE	0 - 10%	with measurements	TOTAL DEPTH															
										25'															
			0	6	12	18				24															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
1																									1
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MATERIALS USED			SIZE/TYPE	QUANTITY	MATERIALS USED			SIZE/TYPE	QUANTITY
WELL SCREEN					GROUT				
SLOT SIZE					BACKFILL				
RISER PIPE					WATER USED				
GRADED SAND					STEAM CLEANER				
PELLET BENTONITE									
GRANULAR BENTONITE									

# Ground Water of Vermont

FIELD SUPERVISOR PARMINDER GREWAL  
CONTRACTOR TDS  
DRILLERS

JOB LOCATION METROMAIL  
RUTLAND, VERMONT  
DATE 10/13/94

DRILLING METHOD  
HOLLOW STEM AUGER

**BORING DIAMETER**

AND	40 - 50%
SOME	10 - 40%
TRACE	0 - 10%

### BORING LOCATION

BORING # MW-2

sketch on back or on-site plan

with measurements

TOTAL DEPTH

25

[illegible]

MATERIALS USED		SIZE/TYPE	QUANTITY	MATERIALS USED		SIZE/TYPE	QUANTITY
WELL SCREEN				GROUT			
SLOT SIZE				BACKFILL			
RISER PIPE				WATER USED			
GRADED SAND				STEAM CLEANER			
PELLET BENTONITE							
GRANULAR BENTONITE							



# Ground Water of Vermont

FIELD SUPERVISOR PARMINDER GREWAL  
CONTRACTOR TDS  
DRILLERS

JOB LOCATION MEDZOMAIL  
RUTLAND, VERMONT  
DATE 10/13/94

DRILLING METHOD  
HOLLOW STEM AUGER

BORING DIAMETER

AND 40 - 50%  
SOME 10 - 40%  
TRACE 0 - 10%

BORING LOCATION

BORING # MW-3

sketch on back or on-site plan  
with measurements

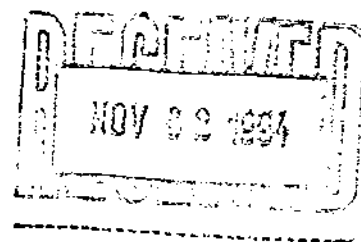
TOTAL DEPTH 36'

			BLOWS PER 6"				SOME 10 - 40% TRACE 0 - 10%		with measurements		TOTAL DEPTH 35'	
DEPTH	SAMPLES	SAMPLE NUMBER					REC.	SAMPLE DESCRIPTION	STRAT CHG	GENERAL DESCRIPTION	WELL DETAIL	DEPTH
			0 6	6 12	12 18	18 24						
1												
2												
3			3	3	3	2		brown fine sand/silt, some cobbles		slight fuel odor		
4												
5'												5'
6												
7												
8			2	2	2	2		NO RECOVERY brown/gray fine sand/silt cobbles		slight odor, moist		
9												
10'			2	2	2	1		brown fine sand & silt smaller cobbles		slight odor		10'
11												
12												
13												
14												
15'												15'
16			1	1	1	1		brown sand/silt, very cobbley		moist, petroleum odor		
17												
18												
19												
20'												20'
21			8	12	15	16		brown fine sand & silt, some small cobbles		petroleum odor, moist		
22												
23												
24												
25'												25'
26			17	100 for 4"				brown fine sand/silt, some cobbles		very moist, slight odor		
27												
28												
29												
30'												30'
31			37	100 for 5"				brown sand, some silt, large gravel		dry, no odor		
32												
33												
34												
35'												35'
36			110	120 for 5"				brown sand, some silt		very dense, dry at bottom wetter top		
37												
40'												40'

MATERIALS USED	SIZE/TYPE	QUANTITY	MATERIALS USED	SIZE/TYPE	QUANTITY
WELL SCREEN			GROUT		
SLOT SIZE			BACKFILL		
RISER PIPE			WATER USED		
GRADED SAND			STEAM CLEANER		
PELLET BENTONITE					
GRANULAR BENTONITE					

**APPENDIX C**  
**LABORATORY REPORT FORMS**





## LABORATORY ANALYSIS

CLIENT NAME:	Groundwater of Vermont	REF #:	10002
ADDRESS:	One Mill Street Box C-5 Burlington, VT 05401	PROJECT NO.:	V94-048
SAMPLE LOCATION:	Metromail	DATE OF SAMPLE:	10/13/94
SAMPLER:	Parminder Grewal	DATE OF RECEIPT:	10/13/94
		DATE OF ANALYSIS:	10/27/94
ATTENTION:	Ron Miller	DATE OF REPORT:	10/31/94

Pertaining to the analyses of specimens submitted under the accompanying chain of custody form, please note the following:

- Soil samples submitted for VOC analysis were not preserved, but were refrigerated until the time of analysis.
- Specimens were processed and examined according to the procedures outlined in the specified method.
- Holding times were honored.
- Instruments were appropriately tuned and calibrations were checked with the frequencies required in the specified method.
- Blank contamination was not observed at levels interfering with the analytical results.
- Continuing calibration standards were monitored at intervals indicated in the specified method. The resulting analytical precision and accuracy were determined to be within method QA/QC acceptance limits.
- The efficiency of analyte recovery for individual samples was monitored by the addition of surrogate analytes to all samples, standards, and blanks. Surrogate recoveries were found to be within laboratory QA/QC acceptance limits, unless noted otherwise.

Reviewed by:

Brendan McMahon, Ph.D.  
Director, Chemical Services

# LABORATORY REPORT

CLIENT NAME:	Groundwater of Vermont	PROJECT CODE:	V94-048
PROJECT NAME:	Metromail	MAV REF.#:	10,002
REPORT DATE:	October 31, 1994	STATION:	MW-3 10'-12'
DATE SAMPLED:	October 27, 1994	TIME SAMPLED:	13:20
DATE RECEIVED:	October 27, 1994	SAMPLER:	Parminder Grewal
ANALYSIS DATE:	October 27, 1994	SAMPLE TYPE:	Soil - 87% dry wt.



## EPA METHOD 8020 ANALYTES + MTBE with GC/MS Confirmation

PARAMETER	PQL (µg/Kg dry wt)	Conc. (µg/Kg dry wt)
Benzene	6	BPQL
Toluene	6	BPQL
Ethylbenzene	6	BPQL
m+p-Xylene	12	BPQL
o-Xylene	6	BPQL
Chlorobenzene	6	BPQL
1,2-Dichlorobenzene	6	BPQL
1,3-Dichlorobenzene	6	BPQL
1,4-Dichlorobenzene	6	BPQL
MTBE	6	BPQL

Surrogate % Recovery: 102%

TPH-GC	1 mg/Kg	81
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BPQL = Below Practical Quantitation Limit (PQL).

# LABORATORY REPORT

CLIENT NAME:	Groundwater of Vermont	PROJECT CODE:	V94-048
PROJECT NAME:	Metromail	MAV REF.#:	10,002
REPORT DATE:	October 31, 1994	STATION:	MW-3 20'-22'
DATE SAMPLED:	October 27, 1994	TIME SAMPLED:	13:30
DATE RECEIVED:	October 27, 1994	SAMPLER:	Parminder Grewal
ANALYSIS DATE:	October 27, 1994	SAMPLE TYPE:	Soil - 88% dry wt.



## EPA METHOD 8020 ANALYTES + MTBE with GC/MS Confirmation

PARAMETER	PQL (µg/Kg dry wt)	Conc. (µg/Kg dry wt)
Benzene	6	BPQL
Toluene	6	BPQL
Ethylbenzene	6	BPQL
m+p-Xylene	12	BPQL
o-Xylene	6	BPQL
Chlorobenzene	6	BPQL
1,2-Dichlorobenzene	6	BPQL
1,3-Dichlorobenzene	6	BPQL
1,4-Dichlorobenzene	6	BPQL
MTBE	6	BPQL

Surrogate % Recovery: 102%

TPH-GC	1 mg/Kg	4
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BPQL = Below Practical Quantitation Limit (PQL).

# LABORATORY REPORT

CLIENT NAME: Groundwater of Vermont

PROJECT NAME: Metromail

REPORT DATE: October 31, 1994

DATE SAMPLED: October 27, 1994

DATE RECEIVED: October 27, 1994

ANALYSIS DATE: October 27, 1994



PROJECT CODE: V94-048

MAV REF.#: 10,002

STATION: MW-3 35'-37'

TIME SAMPLED: 14:20

SAMPLER: Parminder Grewal

SAMPLE TYPE: Soil - 90% dry wt.

## EPA METHOD 8020 ANALYTES + MTBE with GC/MS Confirmation

PARAMETER	PQL (µg/Kg dry wt)	Conc. (µg/Kg dry wt)
Benzene	6	BPQL
Toluene	6	BPQL
Ethylbenzene	6	BPQL
m+p-Xylene	12	BPQL
o-Xylene	6	BPQL
Chlorobenzene	6	BPQL
1,2-Dichlorobenzene	6	BPQL
1,3-Dichlorobenzene	6	BPQL
1,4-Dichlorobenzene	6	BPQL
MTBE	6	BPQL

Surrogate % Recovery: 99%

TPH-GC	1 mg/Kg	3
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BPQL = Below Practical Quantitation Limit (PQL).



### CHAIN OF CUSTODY RECORD

BEST AVAILABLE TIME

DATE: 10/13/94

## ANALYSIS REQUESTED

METALS - PLEASE LIST: NA ( ) EPTOX ( ) (9)

OIL &amp; GREASE: IR ( ) GRAV. ( )

VOLATILE ORGANICS: 624 ( ) 601 ( ) 602 ( )  
8010 ( ) 8015 ( ) 8020 ~~XXXXXX~~ (X) 1477

EXTRACTABLES:	ACIDS ( )	B-H ( )	PCBS ( )
	PESTS ( )		SOLVENTS ( )

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TSS ( ) TDS ( ) PH ( ) SPEC COND ( )

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BACTERIA: SPC ( ) INT COL ( ) REC COL ( )

CYANIDE- AMEN ( ) TOT ( )

105 1 3 1 B

NO3	ZON	NAME
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95	95	95
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97	97	97
98	98	98
99	99	99
100	100	100

TEUP: METALS ( ) VOLATILES ( ) PESTICIDES ( )  
SEMINVOLATILES ( ) HERBICIDES ( )

**OTHER:**

## OTHER

REMARKS

8020 + TPH

8020 + TPV

8020 + TPH

RECEIVED BY

DATE \_\_\_\_\_

## TIME

## MATRIX

**PRESERVATIVE**

| = ICED

A = ACIDIFIED (

**B = BASE**

N = SODIUM BISULFATE

W = AQUEOUS

S = SOLIDS



## LABORATORY ANALYSIS

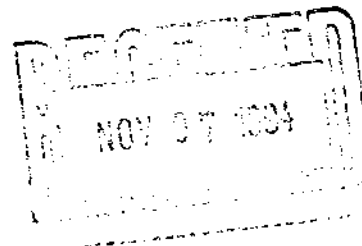
CLIENT NAME:	Groundwater of Vermont	REF #:	10047
ADDRESS:	One Mill Street Box C-5 Burlington, VT 05401	PROJECT NO.:	V94-048
SAMPLE LOCATION:	Metromail	DATE OF SAMPLE:	10/20/94
SAMPLER:	Brian Starer	DATE OF RECEIPT:	10/24/94
		DATE OF ANALYSIS:	10/30,11/1,11/2/94
ATTENTION:	Ron Miller	DATE OF REPORT:	11/3/94

Pertaining to the analyses of specimens submitted under the accompanying chain of custody form, please note the following:


- Water samples submitted for VOC analysis were preserved with HCl.
- Specimens were processed and examined according to the procedures outlined in the specified method.
- Holding times were honored.
- Instruments were appropriately tuned and calibrations were checked with the frequencies required in the specified method.
- Blank contamination was not observed at levels interfering with the analytical results.
- Continuing calibration standards were monitored at intervals indicated in the specified method. The resulting analytical precision and accuracy were determined to be within method QA/QC acceptance limits.
- The efficiency of analyte recovery for individual samples was monitored by the addition of surrogate analytes to all samples, standards, and blanks. Surrogate recoveries were found to be within laboratory QA/QC acceptance limits, unless noted otherwise.

Reviewed by:

Brendan McMahon, Ph.D.  
Director, Chemical Services



# LABORATORY REPORT

CLIENT NAME: Groundwater of Vermont		PROJECT CODE: V94-048
PROJECT NAME: Metromail		MAV REF.#: 10,047
REPORT DATE: November 3, 1994		STATION: MW-1
DATE SAMPLED: October 20, 1994		TIME SAMPLED: 13:20
DATE RECEIVED: October 24, 1994		SAMPLER: Brian Starer
ANALYSIS DATE: November 1, 1994		SAMPLE TYPE: Water

## EPA METHOD 8020 ANALYTES + MTBE with GC/MS Confirmation

PARAMETER	PQL (µg/L)	Conc. (µg/L)
Benzene	1	BPQL
Toluene	1	BPQL
Ethylbenzene	1	BPQL
m+p-Xylene	2	BPQL
o-Xylene	1	BPQL
Chlorobenzene	1	BPQL
1,2-Dichlorobenzene	1	5
1,3-Dichlorobenzene	1	BPQL
1,4-Dichlorobenzene	1	1
MTBE	1	BPQL

Surrogate % Recovery: 102%

TPH - EPA Method 418.1	1 mg/Kg	BPQL
------------------------	---------	------

BPQL = Below Practical Quantitation Limit (PQL).

# LABORATORY REPORT

**CLIENT NAME:** Groundwater of Vermont  
**PROJECT NAME:** Metromail  
**REPORT DATE:** November 3, 1994  
**DATE SAMPLED:** October 20, 1994  
**DATE RECEIVED:** October 24, 1994  
**ANALYSIS DATE:** November 1, 1994



**PROJECT CODE:** V94-048  
**MAV REF. #:** 10,047  
**STATION:** MW-2  
**TIME SAMPLED:** 13:50  
**SAMPLER:** Brian Starer  
**SAMPLE TYPE:** Water

## EPA METHOD 8020 ANALYTES + MTBE with GC/MS Confirmation

PARAMETER	PQL (µg/L)	Conc. (µg/L)
Benzene	1	16
Toluene	1	BPQL
Ethylbenzene	1	BPQL
m+p-Xylene	2	BPQL
o-Xylene	1	BPQL
Chlorobenzene	1	BPQL
1,2-Dichlorobenzene	1	11
1,3-Dichlorobenzene	1	BPQL
1,4-Dichlorobenzene	1	4
MTBE	1	BPQL


Surrogate % Recovery: 102%

TPH - EPA Method 418.1	1 mg/Kg	BPQL
------------------------	---------	------

BPQL = Below Practical Quantitation Limit (PQL).



# LABORATORY REPORT

CLIENT NAME: Groundwater of Vermont		PROJECT CODE: V94-048
PROJECT NAME: Metromail		MAV REF.#: 10,047
REPORT DATE: November 3, 1994		STATION: MW-3
DATE SAMPLED: October 20, 1994		TIME SAMPLED: 14:15
DATE RECEIVED: October 24, 1994		SAMPLER: Brian Starer
ANALYSIS DATE: November 2, 1994		SAMPLE TYPE: Water

## EPA METHOD 8020 ANALYTES + MTBE with GC/MS Confirmation

PARAMETER	PQL (µg/L)	Conc. (µg/L)
Benzene	1	2
Toluene	1	BPQL
Ethylbenzene	1	BPQL
m+p-Xylene	2	BPQL
o-Xylene	1	BPQL
Chlorobenzene	1	BPQL
1,2-Dichlorobenzene	1	7
1,3-Dichlorobenzene	1	BPQL
1,4-Dichlorobenzene	1	2
MTBE	1	BPQL

Surrogate % Recovery: 102%

TPH - EPA Method 418.1	1 mg/Kg	BPQL
------------------------	---------	------

BPQL = Below Practical Quantitation Limit (PQL).



## LABORATORY REPORT

### EPA METHOD 8020 ANALYTES + MTBE with GC/MS Confirmation

CLIENT NAME:	Groundwater of Vermont	PROJECT CODE:	V94-048
PROJECT NAME:	Metromail	MAV REF.#:	10,047
REPORT DATE:	November 3, 1994	STATION:	Field Blank
DATE SAMPLED:	October 20, 1994	TIME SAMPLED:	14:00
DATE RECEIVED:	October 24, 1994	SAMPLER:	Brian Starer
ANALYSIS DATE:	October 30, 1994	SAMPLE TYPE:	Water

PARAMETER	PQL (µg/L)	Conc. (µg/L)
Benzene	1	BPQL
Toluene	1	BPQL
Ethylbenzene	1	BPQL
m+p-Xylene	2	BPQL
o-Xylene	1	BPQL
Chlorobenzene	1	BPQL
1,2-Dichlorobenzene	1	BPQL
1,3-Dichlorobenzene	1	BPQL
1,4-Dichlorobenzene	1	BPQL
MTBE	1	BPQL

Surrogate % Recovery: 102%

BPQL = Below Practical Quantitation Limit (PQL).



## LABORATORY REPORT

### EPA METHOD 8020 ANALYTES + MTBE with GC/MS Confirmation

CLIENT NAME:	Groundwater of Vermont	PROJECT CODE:	V94-048
PROJECT NAME:	Metromail	MAV REF.#:	10,047
REPORT DATE:	November 3, 1994	STATION:	Trip Blank
DATE SAMPLED:	October 20, 1994	TIME SAMPLED:	13:00
DATE RECEIVED:	October 24, 1994	SAMPLER:	Brian Starer
ANALYSIS DATE:	October 30, 1994	SAMPLE TYPE:	Water

PARAMETER	PQL (µg/L)	Conc. (µg/L)
Benzene	1	BPQL
Toluene	1	BPQL
Ethylbenzene	1	BPQL
m+p-Xylene	2	BPQL
o-Xylene	1	BPQL
Chlorobenzene	1	BPQL
1,2-Dichlorobenzene	1	BPQL
1,3-Dichlorobenzene	1	BPQL
1,4-Dichlorobenzene	1	BPQL
MTBE	1	BPQL

Surrogate % Recovery: 102%

BPQL = Below Practical Quantitation Limit (PQL).



The Chace Mill, One Mill Street, Box C-5, Burlington, Vermont, 05401  
(802)-860-6065 (802)-860-6076 Fax

### CHAIN OF CUSTODY RECORD

LABORATORY

PROJECT NUMBER: V94-048

ANALYSIS STATUS:

PROJECT NAME: Metro Mail

**RUSH (2-DAY)**

PROJECT NAME: Metro Mail

PRIORITY (4-DAY)

PROJECT LOCATION: Rutland, VT

X BEST AVAILABLE TIME

PROJECT MANAGER: Bon Miller

ED BY: Brian Steer

DATE: 10/20/94

## ANALYSIS REQUESTED

PAGE 1 OF 1

10047

[illegible]

### MATRIX

W = AQUEOUS  
S = SOLIDS

**PRESERVATIVE**

**I = ICED**

**A = ACIDIFIED**

**B = BASE**

N = SODIUM BISULFATE

VOA - 1:1 HCl 4 drops  
14 Amber 1:1 HCl 2 ml

**RELINQUISHED BY**

DATE \_\_\_\_\_

## TIME

RECEIVED BY

阮 洪

10/24/94	8:30 AM
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125